

CLAIMS

What is claimed is:

1. A pressure management system that balances pressure between first and second fluid circuits of a fuel cell system, comprising:
 - a first fluid reservoir associated with said first fluid circuit; and
 - a second fluid reservoir associated with said second fluid circuit and in fluid communication with said first fluid reservoir, wherein a fluid is transferred from said first fluid reservoir to said second fluid reservoir during an over-pressure condition within said first fluid circuit.
2. The pressure management system of claim 1 further comprising a fluid passage that enables said fluid communication between said first and second fluid reservoirs.
3. The pressure management system of claim 2 wherein a first fluid retained within said first fluid reservoir flows into said second fluid reservoir during said over-pressure condition.
4. The pressure management system of claim 1 further comprising a first relief mechanism that is disposed between said first and second fluid reservoirs and that selectively enables fluid communication between said first and second fluid reservoirs.

5. The pressure management system of claim 4 wherein when a first pressure is achieved within said first fluid reservoir, said fluid flows through said first relief mechanism to said second fluid reservoir to relieve said first pressure.

6. The pressure management system of claim 4 further comprising a second relief mechanism that is disposed between said first and second fluid reservoirs and that selectively enables fluid communication between said first and second fluid reservoirs.

7. The pressure management system of claim 6 wherein when a second pressure is achieved within said second fluid reservoir, said fluid flows through said second relief mechanism to said first fluid reservoir to relieve said second pressure.

8. The pressure management system of claim 1 further comprising a relief mechanism in fluid communication with said first fluid reservoir, said relief mechanism exhausting said fluid to atmosphere during a critical pressure condition.

9. A method of managing pressure between first and second fluid circuits of a fuel cell system, comprising:

detecting a first pressure within a first fluid reservoir associated with said first fluid circuit;

transferring a fluid from said first fluid reservoir to a second fluid reservoir associated with said second fluid circuit when said first pressure achieves a first threshold level.

10. The method of claim 9 further comprising opening a first valve associated with said first fluid reservoir to enable said transfer of fluid when said first pressure achieves said first threshold level.

11. The method of claim 9 further comprising transferring a fluid from said second fluid reservoir to said first fluid reservoir associated with said second fluid circuit when a second pressure in said second fluid reservoir achieves a second threshold level.

12. The method of claim 11 further comprising opening a second valve associated with said second fluid reservoir to enable said transfer of fluid when said second pressure achieves said second threshold level.

13. The method of claim 9 further comprising releasing fluid to atmosphere when a combined pressure in said first and second fluid reservoirs achieves a release level.

14. The method of claim 13 further comprising:
detecting a hydrogen content of said fluid released to atmosphere; and
signaling an alert if said hydrogen content is above a threshold level.

15. The method of claim 9 further comprising:
detecting a combined pressure of said first and second fluid reservoirs;
and
suspending operation of said fuel cell system if said combined pressure achieves a shut-down threshold.

16. The method of claim 9 wherein said fluid is a hydrogen-containing gas.

17. A fuel cell system, comprising:

a fuel cell having a hydrogen-containing feed gas flowing therethrough;

a first fluid circuit that includes a first fluid reservoir, that is in fluid communication with said fuel cell and that has a first fluid flowing therethrough;
and

a second fluid circuit that includes a second fluid reservoir and that has a second fluid flowing therethrough, wherein a fluid is transferred from said first fluid reservoir to said second fluid reservoir during an over-pressure condition within said first fluid circuit.

18. The fuel cell system of claim 17 further comprising a fluid passage that enables fluid communication between said first and second fluid reservoirs.

19. The fuel cell system of claim 18 wherein said first fluid from said first fluid reservoir flows into said second fluid reservoir during said over-pressure condition.

20. The fuel cell system of claim 17 further comprising a first relief mechanism that is disposed between said first and second fluid reservoirs and that selectively enables fluid communication between said first and second fluid reservoirs.

21. The fuel cell system of claim 20 wherein when a first pressure is achieved within said first fluid reservoir, said fluid flows through said first relief mechanism to said second fluid reservoir to relieve said first pressure.

22. The fuel cell system of claim 16 further comprising a second relief mechanism that is disposed between said first and second fluid reservoirs and that selectively enables fluid communication between said first and second fluid reservoirs.

23. The fuel cell system of claim 22 wherein when a second pressure is achieved within said second fluid reservoir, said fluid flows through said second relief mechanism to said first fluid reservoir to relieve said second pressure.

24. The fuel cell system of claim 17 further comprising a relief mechanism in fluid communication with said first fluid reservoir, said relief mechanism exhausting said fluid to atmosphere during a critical pressure condition.

25. The fuel cell system of claim 24 further comprising a hydrogen sensor that detects a hydrogen-content of said atmosphere and signals an alert if said hydrogen content achieves a threshold level.

26. The fuel cell system of claim 17 further comprising a pressure sensor that detects a combined pressure of said first and second fluid reservoirs and signals an alert if said combined pressure achieves a threshold level.